REFORMING PARKING POLICIES TO SUPPORT SMART GROWTH

Toolbox/Handbook:
Parking Best Practices & Strategies For Supporting Transit Oriented Development

Prepared for the

Metropolitan Transportation Commission

by

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INTRODUCTION

This report is intended to serve as a guide or a handbook for communities interested in planning and implementing parking policies and programs that are supportive of Smart Growth and Transit Oriented Development (TOD). The focus is on downtowns, neighborhoods, and transit station areas in which a major investment has been made to provide regional and local transit accessibility. In order to maximize the value of that investment and to discourage the solo use of the automobile for travel, this report will assist communities in identifying the TOD supportive parking policies and improvements that are best suited their to individual characteristics.

It is important to note that the research conducted during these studies and a number of recent similar efforts have shown that the parking related objectives needed to support TOD can be achieved through a broad variety of actions and initiatives. In short, there are a number of ways to solve a given problem. For that reason this handbook includes a “toolbox” of proven parking management initiatives and actions which can be applied to address a given issue or objective.

HOW TO USE THIS HANDBOOK

This handbook is designed to assist city officials and political decision makers with the planning and implementation of parking policies and programs designed to encourage and support Smart Growth and TOD. This handbook is organized to facilitate quick access to a variety of approaches and programs that can be selected based on the specific characteristics of each community. To best use this handbook proceed as follows:

Step 1: Defining Your Community

Go to this section of the report to determine which of five distinct location types best defines the characteristics of your community:

- Urban Downtown
- Urban Neighborhood
- Suburban/Small Downtown
- Suburban Transit Station
- Rural/Small Town

Step 2: Identify Candidate Policies

Use the matrix or go to the page which outlines the policies and programs which have been shown to work in your type of community. This indicates which policies might be good candidates for your community.

Step 3: Best Practices

The section of this report on Best Practices provides more information about the candidate policies and programs, and provides examples of where they have worked elsewhere. It also provides information about the resource documents that are available for your use and the current practices of Bay Area communities.

Step 4: Implementation Guidelines

This section of the report provides tools and a guide for communities to develop and implement new parking policies. It shows communities how to determine the appropriate amount of parking that should be provided with new development, and explains the best approach or process for gaining support of the community to move into implementation of the selected policies.

DEFINING YOUR COMMUNITY

Potential Policies for Different Types of Areas

The appropriate mix of parking policies and parking management strategies are unique for each agency and jurisdiction. The mix must consider various factors that can relate to local objectives, existing parking occupancy, investment that is occurring, auto ownership and alternative travel mode availability. However, there are some general approaches that can be used for different types of areas. The matrix on this page presents the general strategies that can be applied in each type of area. Learn more about these strategies by referring to the Best Practices section of this report. Learn more about the location types in the following pages.

Strategies	Urban Downtowns	Urban Neighborhoods	Suburban/Small Urban Downtowns	Suburban Transit Stations	Rural/Small Town
	Location Types				
1 Transit/TOD Supportive Policies					
Carsharing	★	★		★	
Transit Friendly Parking Design	★	★	★	★	★
Transit Overlay Zones	★			★	
Transit Incentive Programs	★	★	★	★	★
Walkability and Wayfinding	★	★	★	★	★
2. Parking Requirements					
Reduced Parking Requirements	★	★	★	★	★
TOD Friendly Parking Requirements	★	★		★	
Parking Maximums	★	★		★	
Shared Parking	★	★	★	★	★
3. Parking Pricing					
On-street Parking Pricing	★	★	★	★	
Variable Rate Parking Pricing	★	★	★	★	
Coordinated Off-street and On-street Pricing	★	★	★	★	
Unbundled Parking	★	★		★	
Parking Cash-Out	★	★	★	★	
4. Parking Management Strategies					
Parking Payment Technology	★	★	★	★	
Parking Database	★	★	★	★	★
Real-time Parking Information	★	★	★	★	
5. Parking Districts					
Assessment Districts	★	★	★	★	★
Revenue Districts	★	★	★	★	★
Residential Permit Parking	★	★	★	★	
6. Parking Financing					
In-Lieu Fees	★	★	★	★	★
Risk Fund	★	★	★	★	
Parking Occupancy Tax	★	★		★	
Parking Tax by Space	★	★	★	★	
Tax Exemptions and Variable Rate Tax	★	★		★	
Grants	★	★	★	★	

Questionnaire 1 – Area Land Use/Transit/Parking Characteristics

1. Size of Proposed Study area
   - ____# linear blocks long
   - ____# linear blocks wide

2. Land use and/or zoning of proposed study area
   - ____Transit village or TOD
   - ____Redevelopment Area
   - ____Retail/Commercial District
   - ____Other Special designation in general plan or zoning

3. Transit Access/Availability
   - ____# of transit operators serving area/district
   - ____# of fixed routes serving area/district on (<15 min headway)

4. Our Parking Rates are
   - ____Same in study area as the whole city
   - ____Lower in the study area
   - ____High, seem to make downtown/infill development difficult
   - ____Sufficient, seem to meet our needs

Questionnaire 2 – Is there a need for new parking policy?

1. Parking Conditions in Study Area

A. Supply

- ____free parking everywhere
- ____on-street meters
- ____free off-street parking lots
- ____paid off-street parking
- ____employee permit parking
- ____residential permit parking (RPP)
- ____free residential parking

B. Demand

- ____We don't have enough parking
- ____We have too much parking
- ____Parking for transit use spills over to adjacent streets
- ____Parking for commercial areas spills over into residential areas
- ____Employees park on street in front of businesses

2. Key Concerns

- ____Business concerned with lack of customer parking
- ____Employees concerned with lack of parking
- ____Residents concerned with parking in neighborhood
- ____Developers concerned with parking requirements
- ____Parking Enforcement
- ____Traffic congestion
- ____Code Issues
- ____Other

3. Candidate Strategies our city would like to explore
(rank 5 highest to 1 lowest)

- ____Pricing Parking
- ____Residential and/or employee permit parking programs
- ____Shared Parking/Time restrictions
- ____Parking Benefit Districts
- ____In-lieu Parking Fees
- ____Parking Cash-out
- ____Provision of Pedestrian and Bicycle Amenities
- ____Reduced Minimum Parking Requirements
- ____Maximum Parking Requirements
- ____Unbundling Parking
- ____Use of New Technologies

4. Candidate Strategies our city already uses

- ____Pricing Parking
- ____Residential and/or employee permit parking programs
- ____Shared Parking/Time restrictions
- ____Parking Benefit Districts
- ____In-lieu Parking Fees
- ____Parking Cash-out
- ____Provision of Pedestrian and Bicycle Amenities
- ____Reduced Minimum Parking Requirements
- ____Maximum Parking Requirements
- ____Unbundling Parking
- ____Use of New Technologies
- ____Other _____

URBAN DOWNTOWNS

Urban Downtown areas consist of high-rise office buildings, commercial services, ground floor retail and market based parking pricing. They can include high-density residential development. These downtowns are regional destinations with intensive transit access such as BART, Caltrain, MUNI light rail or VTA light rail. Examples include downtown Oakland, San Francisco, or San Jose.

Potential policies that can be applied to urban downtowns are listed below. Refer to the Best Practices section of this report for more information on each policy or program:

1. Transit/TOD Supportive Policies

These policies and programs are designed to support the use of transit and to create a walkable transit friendly environment, reducing or eliminating the need for a private automobile. Relevant examples include:

- **Carsharing**
- **Transit Friendly Parking Design**
- **Transit Overlay Zones**
- **Transit Incentive Program**
- **Walkability and Wayfinding**

2. Parking Requirements

Managing the amount of parking associated with new development is an effective way to allow increased density and to support transit. These policies focus on reducing or limiting the amount of parking that is required and encourage efficient use of the parking. Examples of this approach which are relevant to downtowns include:

- **Reduced Parking Requirements**
- **TOD Friendly Parking Requirements**
- **Parking Maximums**
- **Shared Parking**

3. Parking Pricing

Pricing has long been recognized as the most powerful parking management tool. Effective pricing policies can be used to discourage commuter parking and increase customer access to convenient short-term parking supplies. Revenues from parking can be used to fund transit supportive parking and transportation improvements. A broad range of pricing policies are available for application in urban downtowns:

- **On-street Parking Pricing**
- **Variable Rate Parking Pricing**
- **Coordinated Off-street and On-street Pricing**
- **Unbundled Parking**
- **Parking Cash-Out**

4. Parking Management Strategies

Information is a key element of parking management. Effective management of the parking supply and pricing requires access to accurate data defining existing and historic parking characteristics. Research has also shown that consumers respond well to new parking technologies which provide them with information about parking and make paying for parking more convenient. The types of strategies include:

- **Parking Payment Technology**
- **Parking Database**
- **Real-time Parking Information**

5. Parking Districts

A parking district is a tool which supports the development of parking and transportation improvements within a given area. Recently is has been shown that property owners, businesses, and downtowns are very supportive of programs designed to return revenues from parking back to the district in which they were collected as a means of making desired improvements to the area. Two basic types of districts exist:

- **Assessment Districts**
- **Revenue Districts**

6. Parking Financing

There are many tools and methods available to finance the development of parking and parking related transportation improvements. These include:

- **In-Lieu Fees**
- **Risk Fund**
- **Parking Occupancy Tax**
- **Parking Tax by Space**
- **Tax Exemptions and Variable Rate Tax**
- **Grants**

BEST PRACTICES

During the recent Transit Oriented Development (TOD) Policy Project conducted by MTC, the participating cities and agencies indicated that the lack of appropriate parking policies and practices were a key obstacle to their efforts to implement TOD around the transit nodes in their communities. A review of the current practices of Bay Area jurisdictions revealed that many cities already have parking policies that are supportive of TOD in place. However, it was found that these cities also find it hard to overcome deep seated resistance to reduced parking requirements, increased parking fees, and the other key elements of TOD supportive parking policies. In general, the cities need access to more information and examples of how other communities have implemented these policies and have seen successful results. This discussion of the best practices of other cities focuses on the six key areas that have been identified as potential TOD supportive parking policies and programs:

1. **Transit/TOD Supportive Policies**
2. **Parking Requirements**
3. **Parking Pricing**
4. **Parking Management Strategies**
5. **Parking Districts**
6. **Parking Financing**

These topics are discussed in more detail in this section of the report. For those who desire even more information, please refer to the Task 3 Report – Best Practices which is in the companion document to this report, the Compendium of Technical Papers.

EXISTING BAY AREA PARKING POLICIES

A survey of Bay Area cities conducted by MTC was used to document current approaches to parking policies and practices. The survey and review of the parking requirements and policies currently used by Bay Area cities revealed the following:

1. Much of the classic literature on parking is oriented towards free, auto-dependent suburban land uses.

2. Cities seeking to develop new parking policies and programs have a number of technical resources available to them. However, many of the resources offer limited and confusing information for cities seeking to modify their parking requirements or to develop other parking management policies. A list of these documents are provided on the next page.

3. Cities tend to copy the parking requirements adopted by their neighbors and other peer cities rather than invest the major effort required to develop requirements that are truly relevant to the city's characteristics and goals.

4. Most cities have a one-size fits all uniform parking requirement which covers the entire city. Parking requirements in these cities do not change with density and transit availability, which inhibits TOD in those areas which have good levels of transit access.

5. Many Bay Area cities have adopted policies and programs specifically designed to promote smart growth and TOD already, but have not been able to implement these policies.

6. Traditional concepts of land use and parking are hard to displace. Any successful effort to adopt progressive parking policies must address the numerous concerns of the various stakeholder groups and the political decision makers.

7. Because many cities have already taken the steps to adopt progressive parking management policies and measures, the other cities can benefit directly from their experience. The perceived risks of being a pioneering community can be diminished through sharing of experiences and information, which is one of the key objectives of this project.

Those desiring more information about current policies and practices should go to the Task 2 Report - Existing Bay Area Parking Policies in the companion document to this report, the Compendium of Technical Papers.

RESOURCE DOCUMENTS

The following documents and resources are available to assist communities in the development of new parking policies and programs.

Institute of Transportation Engineers' (ITE) Parking Generation

While this document is the best source of parking demand data by land use type, cities hoping to develop parking policies supportive of smart growth and TOD will generally not find this resource very helpful. The information tends to be for suburban land uses and generally is not applicable to urban and semi-urban settings.

National Parking Association/Urban Land Institute's Dimensions of Parking

While this document is a good general resource for information about most aspects of parking, there is not much information in this publication to assist cities interested in smart growth or TOD oriented parking policies. Some of the topics which are described in Dimensions of Parking are a review of the analysis tools which help assess parking needs; the potential costs of providing new parking; the development of local land use and zoning requirements; and the elements of functional parking design.

American Planning Association's Flexible Parking Requirements

Given the variability of parking within different communities, the American Planning Association (APA) has developed recommendations to assist cities and jurisdictions in creating flexible parking regulations. This document is an excellent resource for cities to use to establish parking requirements which reflect actual local characteristics and which provide the degree of flexibility required to encourage innovation in development practices.

Weant and Levinson and the Eno Foundation's Parking

In the publication entitled Parking, Weant and Levinson in collaboration with the Eno Foundation take a comprehensive view of parking, covering a broad range of topics. Parking reviews a variety of topics from assessing different types of parking demands to citing examples of parking experiences throughout the nation.

Urban Land Institute's Shared Parking

The Urban Land Institute (ULI) report Shared Parking, presents the findings of shared parking research over the past 22 years. In its first publication in 1983, Shared Parking established a methodology for shared parking analysis. Shared Parking is an excellent resource for cities to develop parking requirements for specific projects, land uses, and combination of land uses. The methodology is, however, fairly labor intensive. The base parking demand ratios that are provided are largely for suburban land use types, and as a result care must be taken when applying these ratios to an urban or semi-urban settings.

Donald Shoup's The High Cost of Free Parking

No publication on the subject of parking has stimulated as much discussion and interest as The High Cost of Free Parking by Donald Shoup. Shoup, a professor of planning at the University of California, Los Angeles, has spent most of his career researching parking and land use relationships. The High Cost of Free Parking is a good introduction to many of the basic principles and concepts surrounding the development and implementation of parking policy. It is well written and comprehensive. The conclusions or recommendations could be used by cities to modify their parking programs and policies in ways which would support smart growth and TOD. It does advocate these particular approaches, and does not fully explore other types of programs or policies which might lead to similar results.

Victoria Transport Policy Institute's Parking Solutions, A Comprehensive Menu of Solutions to Parking Problems

The Victoria Transport Policy Institute under the leadership of Todd Littman, its founder and director, has developed a website entitled Parking Solutions, A Comprehensive Menu of Solutions to Parking Problems < http://www.vtpi.org/tdm/tdm72.htm >. The website is unique in that it provides an accessible on-line source of information regarding solutions to common parking problems. This website is a good resource for information of parking policies and programs which are supportive of TOD and Smart Growth.

1 TRANSIT / TOD SUPPORTIVE POLICIES

A key component of a parking management program is to combine parking strategies with an increase in transit service options or in an area with lots of transit options. Transit improvements and incentives help reduce parking demand and create viable alternative modes in areas trying to implement parking management and pricing programs. Downtowns and town centers with high-quality transit benefit greatly by using transit as a resource in-lieu of parking spaces. This can result in a reduction of parking demand that combined with transit use and pedestrian improvements, creates a more vibrant, walkable area.

Carsharing

Carsharing programs provide participants with access to a fleet of centrally owned and maintained vehicles located near residences, workplaces, or transit hubs. Members typically reserve shared vehicles for a specific timeframe and pay for use through some combination of hourly, overhead, and mileage-based rates.

Implementation of carsharing offers compelling parking management benefits. First, by distributing the fixed costs of car ownership into the marginal cost of every trip made, carsharing reduces the total number of trips made by participants. Secondly, by offering an alternative to individual car ownership, carsharing programs have helped participants eliminate one or more existing household vehicles. By increasing the number of users per vehicle and encouraging more frequent use throughout the day, carsharing programs directly reduce parking demand while preserving the convenience and flexibility of automobile use for participants.

Transit Friendly Parking Design

In many communities, parking facilities are designed strictly for the convenience of the automobile user with no consideration for transit. In suburban communities, up to 75 percent of the site can be dedicated to surface parking (Tri-Met, 1996). It is important to consider street orientation, pedestrian entrances and links to transit service (Calgary Transit, 2006). This includes reducing the visibility of parking structures and parking lots (reducing “dead space”), creating an area with destinations that encourage walkability. Often times, these areas can create more transit and pedestrian friendly parking by either disguising parking to look like adjacent buildings or by adding retail outlets and display cases at ground level of the parking structures.

Transit Overlay Zones

Transit can also be supported by the use of transit overlay zones and transit friendly parking design. In a transit overlay zone, cities modify the underlying zoning regulations to ensure that development encourages greater transit use and support efficient transit service. For example, the Transit Overlay Zone in the City of Mountain View allows for the creation of corporate neighborhoods that are integrated with a new light rail station.

TOD and Transit Overlay Zones allow for more density while reducing parking requirements. It is directly linked to transit incentives (employer sponsored bus passes) and/or through the zoning and permitting process that require new developments, at a minimum, to meet the exiting peak hour transit mode split through the use of TDM actions, allowing shared parking use and granting density bonuses for certain uses or development design.

Transit Incentive Programs

Transit Incentive programs vary from passive and indirect to planned under an overall strategy mandated through local ordinance, law or promulgated rulemaking. Although broadly considered as part of Transportation Demand Management actions, incentive programs are generally implemented at the local level by transit providers (bus passes, fare free zones, fare discounts to seniors, school kids, etc), individual employers or through TMAs, and through special user side subsidies from social service agencies or school districts. The most common incentive is a pass program. In areas with a parking shortage, group discount pass programs may reduce parking demand, shifting commuters from driving alone to transit.

Walkability and Wayfinding

A key consideration in the development of smart growth and TOD parking strategies is the development of a walkable environment. Often times, motorists will experience a parking shortage in the immediate vicinity of their final destination while ignoring the availability of parking spaces within a short walking distance. Encouraging the creation of comfortable walking areas and linkages between parking facilities and destinations improves customer perception and brings more parking spaces into the total parking supply.

Carsharing

Example: San Francisco Parking Requirement Reduction

The San Francisco Planning Department granted a variance to construct the 141-unit Symphony Towers apartments with only 51 spaces (rather than the required 141) in part because of the commitment for two car sharing parking spaces and the use of unbundled parking (Shoup, 2005).

Example: City of Berkeley Fleet Replacement

The City of Berkeley, California retired its fleet vehicles and replaced them with carsharing vehicles saving an estimated $250,000 in the first three years of the program (KRON4, 2004; City of Berkeley, 2005).

Transit Friendly Parking Design

Example: Los Angeles County Metropolitan Transportation Authority Transit Friendly Parking Design

In Los Angeles, the Los Angeles County Metropolitan Transportation Authority developed transit friendly parking design credits as part of its congestion management program. It also included development credits for projects willing to implement parking pricing (Kodama, Willson, Walker Parking Consultants et al, 1997).

Transit Overlay Zones

Example: City of Oakland – Transit Oriented Development Zone Regulations (Chapter 17.100 S-15)

The S-15 zone is intended to "create areas devoted primarily to serving multiple nodes of transportation and to feature high density residential, commercial and mixed-use development to encourage a balance of pedestrian-oriented activities, transit opportunities and concentrated development." The S-15 zoning regulations are used to create high-density transit oriented development.

The S-15 zones require parking as provided in Chapter 17.116. The actual number of required parking spaces is generally determined by the Director of City Planning.

Transit Incentive Programs

Example: Santa Clara Valley Transportation Authority Annual Pass Program

The Santa Clara Valley Transportation Authority offers ECO passes for businesses and residential communities. Employers can purchase an annual ECO pass for all full-time employees at a discounted price based upon service and number of employees. Residential communities such as condominiums, apartments, townhouses, homeowner associations and community associations can also purchase ECO passes for their residents at a discounted price. Customers can use these passes on any SCVTA bus or rail line. The use of these passes saves the user on the cost of a transit pass, increases transit ridership and results in a lower demand for parking.

Walkability and Wayfinding

Examples:

Philadelphia, PA; San Antonio, TX; and Indianapolis, IN have developed pedestrian Wayfinding systems that make it easier for visitors to walk from parking structures to major attractions.

The City of Burbank (1992) used a combination of priority parking for customers, shared parking, employee parking pricing, and pedestrian improvements to revitalize its downtown area, creating an entertainment area with 35 restaurants, a downtown shopping center, movie theaters, anchor retailers and specialty retail shops. Pedestrian improvements create a core walkable environment and provide linkages to shared parking facilities (Wilbur Smith, Kodama et al, 2005).

IMPLEMENTATION

This section of the report presents information on how to best implement TOD supportive parking policies and programs in your community. Like many community issues, parking is generally a sensitive topic and affect change can be difficult. A key issue is overcoming the many deeply inbreed notions or myths about parking which tend to be held by many individuals. Anyone who drives is a parking expert, and is likely to hold strong opinions about what is right and wrong about parking. By far, experience has shown that the communities that are able to implement new parking policies and programs are those that have been successful in allowing the stakeholders to participate effectively in the process of defining the problems and developing the solutions.

The keys to successful implementation of a parking management program include:

1. Stakeholder Involvement – local residents, business owners, property owners, developers and other interests need to be identified and placing in a role which allow them to actually participate in the process of developing parking solutions.

2. Parking Information – It is critical that a solid foundation of parking supply and utilization information be available to assist and educate the stakeholders during the process, and to dispel the misinformation that is likely to exist.

3. Analysis – Technical tools such as the parking demand model developed as part of this project need to be applied to measure current and future parking supply and demand relationships, as well as to test the impacts of pricing strategies.

4. Best Practices – Implementing new parking policies and programs can involve complex institutional, legal, and technological challenges. Understanding how others have overcome these obstacles can pave the way for a smooth implementation process.

5. Monitoring – Parking management is about modifying human behavior. It is no small challenge. It is important to have reliable before and after information whenever new parking measures are implemented. Effective monitoring will support fine-tuning of the program to improve performance, and will help to dispel misguided anecdotal accounts of the results.

1 STAKEHOLDER INVOLVEMENT

Effective stakeholder involvement can be the most difficult part of any effort to enact new parking policies and programs. It requires a lot of time and effort and still the results may be frustrating. It is almost inevitable, however, that proposed parking solutions that have been developed without attention to the stakeholders will end up being torpedoed by an outraged public when they are brought before the political decision makers. Key elements of stakeholder involvement include:

- **Identification of the Stakeholders** – It is important to identify all of the key individuals who would best represent the interests of the area. This should include residents, business owners, employees, property owners, elected officials, representatives of neighborhood groups and business associations, and any other parties or groups with a direct interest in parking. This process should include contacting known stakeholders to allow them the opportunity to suggest other individuals who should participate.

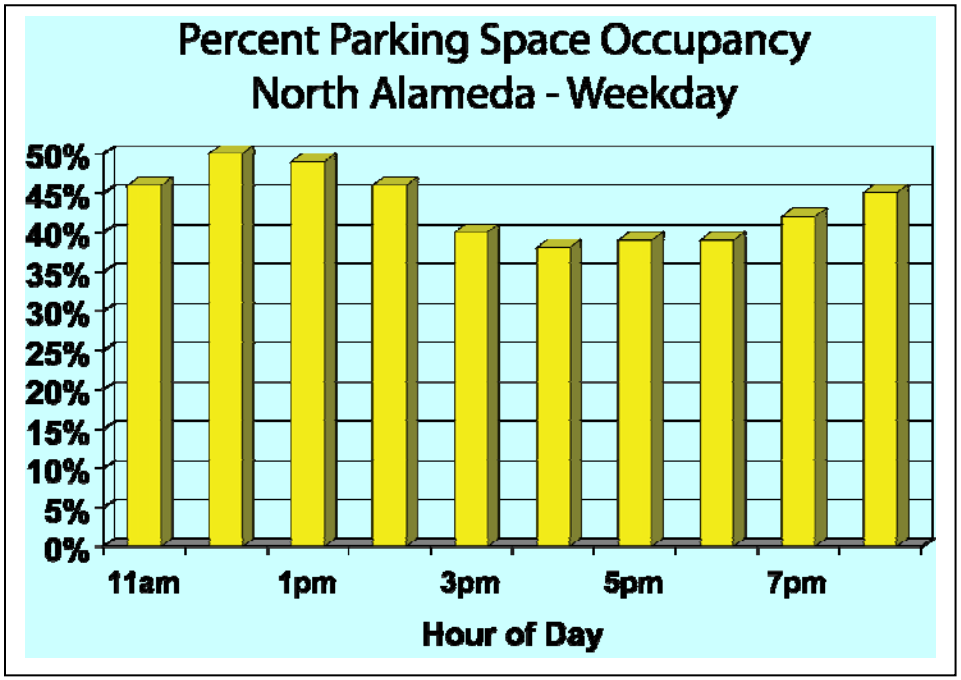
- **Engaging the Stakeholders** – It must be demonstrated to the stakeholders that their involvement is sincerely desired and that their input will be given full account. Interviews with the stakeholders can be effective if there is a follow up to the interview to assure them that their input is being used. A very effective method of gaining stakeholder participation is to form a "Parking Task Force" or parking advisory group; thereby empowering them to play a key role in the process.

- **Public Information/Involvement** – In addition to the key stakeholders the general public needs opportunities to become informed and participate. Project websites and newsletters are good tools, as are the use of the news media to provide information about the project. Public meetings, open houses, and workshops are also an effective tool to allow the public to participate.

- **Creating a Sponsorship** – The ideal outcome of a stakeholder process is where a coalition of the stakeholders become the sponsors or supporters of the parking plan in which they had a stake in developing.

Parking Information

The basic data collection required for a good data base consists of three elements:

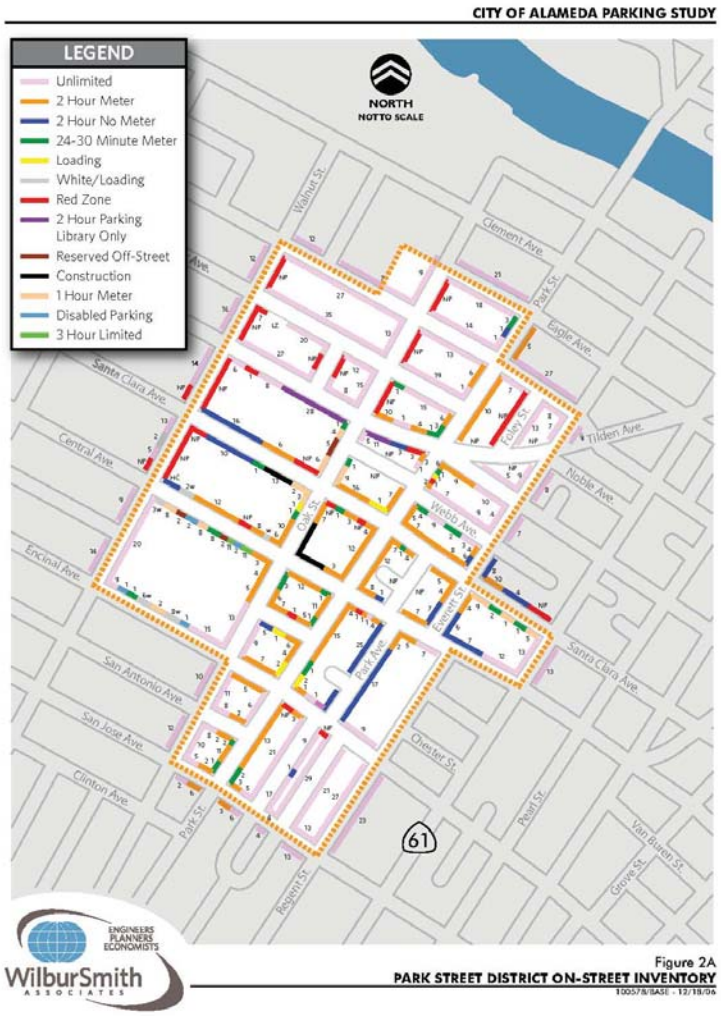


1. Parking Space Inventory

Once the study area is defined all of the public parking spaces in the area need to be inventoried. This would include all the on-street parking and all of the off-street parking which is accessible to the public, including both public and privately owned parking. The inventory should be recorded on a block-by-block basis. All the on-street spaces on each block face should be counted by type. Time limits, parking fees, loading zones, and other types of on-street parking should be noted. All the off-street spaces in each block should be counted noted any time restrictions, fees, or other provisions that affect the use of the parking. Parking facilities that are strictly dedicated to a specific use, such as parking for a bank or an apartment complex, should be noted as such as this parking can only be used to serve the demand of a single land use and is not actually available for general public use.

2. Parking Occupancy Survey

Once the parking space inventory is prepared, a field occupancy survey can be conducted. The purpose of the occupancy survey is to determine on a block-by-block basic the number of cars parked at a given time of day. This is done by systematically counting the number of cars parked along each block-face and in each off-street parking facility. Typically the counts would be performed once each hour throughout the day, taking care to assure that the survey covers the period(s) of peak peaking activity during the day.



3. Land Use Inventory

A critical input into the parking demand model is the inventory of land use. Unfortunately this information is not typically available in a useful and accurate from. What is needed is a description of the building types and sizes (square footages or number of units) occupying each parcel in the study area. While overall a vacancy rate of 10 to 15 percent is pretty common and does not required special consideration, it is important to make note of any major vacancies that would result in a much higher vacancy rate.

Once the data has been collected it is important to invest the time and effort to prepare summaries of the information. Graphs and maps such as those shown on these pages can be a very helpful communications tool.

Analysis

With the availability of a good parking information database as discussed in the last section, the opportunity to use a number of analytical tools exists. Each of these is discussed below:

Parking Demand Model

Understanding the impact of policy changes on parking supply and demand is critical to informing decision makers as to the implications of proposed actions. A parking demand model, such as the one developed for this project, estimates the demand for parking taking into account the characteristics of the area such as transit availability, walkability, auto ownership and the types and densities of land use. The model also is able to reflect impacts of parking pricing on demand. During the course of this project the demand modeling process was applied to 8 case study cities. The table shown here was developed from the case study results and from the information gathered during the Best Practices research. It can be used as a general guide to identify the range of parking requirements that would characterize each of the locations types identified in this project. For more information on the use of the parking demand model please see the Task 3.2 report *Parking Demand Model Methodology* in the *Compendium of Technical Reports.*

Recommended Parking Requirements

		Location Types									
Land Use	**Unit**	**Urban Downtowns**		**Urban Neighbor-hoods**		**Suburban/ Small Urban Downtowns**		**Suburban Transit Stations**		**Rural/Small Town**	
		Low	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
Residential	**Dwelling**	0.25	1.00	0.50	1.25	1.00	1.50	1.25	2.25	1.50	2.50
Office	**1000 sq.ft**	0.10	0.75	0.25	1.25	2.00	3.00	2.25	3.33	3.00	4.00
Retail	**1000 sq.ft**	0.50	1.00	1.00	2.00	1.50	2.50	2.50	4.00	3.00	4.00
Restaurant	**1000 sq.ft**	1.00	2.00	1.00	3.00	3.00	5.00	4.00	8.00	8.00	12.00

Supply/Demand Comparisons

Once the parking demand model has been developed it is possible to use the model and the inventory of parking supply to do comparisons on parking supply and demand. These are usually done on a block-by-block basis. For each block the estimated parking demand is compared with the available supply, with the difference representing either a surplus or a deficiency in parking for that particular block. Because people often park outside of the block where there destination is located, a good practice is to combine those blocks that make up a logical cluster or zone. When this is done, a better picture will emerge in terms of whether or not there is a surplus or deficiency of parking. It is unusual for the parking supply over a large area to be at 100% occupancy even when the demand is known to exceed the supply. This is because there is an inherent inefficiency in matching cars with vacant spaces. When

someone leaves a space, it may be several minutes before someone seeking a space manages to find the vacant space. Off-street parking and parking in more remote areas may never fill up because people simply don't know it is there, or would rather drive around looking for a more convenient or cheaper space. Because of this phenomenon, many parking researchers have suggested that the supply in supply/demand comparisons should be reduced 10 to 15% to represent the "practical capacity" of the parking system. In more urban areas, care should be taken using this approach as it will tend to overstate the amount of the deficiency and potentially encourage more parking construction rather than a focus on improving parking efficiency.

Financial Models

The fiscal impacts of proposed parking programs and improvements need to be understood in order to make sound decisions. For example the impact of replacing parking meters with pay-and-display machines needs to take into account the capital costs of acquiring and install the new equipment and removing the parking meters. New signage and pavement markings may also be needed. Once the new equipment is in place there needs to be an understanding of how much it will cost to operate and maintain the equipment, and to collect the revenue as compared with the current parking meters. Also the costs of enforcement may change. For parking purposes two types of financial models are typically needed:

- Capital Program Development Model – The development costs of a program include both the "hard" costs of equipment purchase, installation, and/or construction; and the "soft" costs of program implementation. Soft costs include expenditures on program development, planning, and design; costs of obtaining clearances and approvals, cost of soliciting and reviewing bids, and costs of administering the installation of the equipment. If special financing is needed to fund the project, then the costs of the financing need to be included as a soft cost.
- Program Cash-Flow Model or Proforma – In simple terms a parking program has certain costs of operation and revenues. The comparison of costs and revenues provides an estimate of the net revenue that the program will generate. A proforma is a multiyear statement of costs and revenues. Even in a relatively static program, over time costs of operation will increase due to inflation and revenues may increase due to growth in demand or changes in parking fees. Once developed a cash flow model can be used to view the likely changes in cost and income that would occur over a period of many years.

With both a capital program and a cash-flow model it is possible to provide a long-term view of the implications of major parking program changes such as the purchase of new equipment, the construction of new parking, or other changes in operation.

Best Practices

The majority of cities are not really interested in being the pioneers with new parking policies or programs, unless it is absolutely necessary. Even those cities that are willing to pursue new paths can benefit from the experiences of other cities that have tried or considered similar ideas. The best practices research that was conducted as part of this studied revealed that good examples of all of the many candidate policies and programs that were identified can be found around the country. In fact, many of them are already in place somewhere in the Bay Area. Using the resources developed as part of this project, cities can find examples of each of the many policy and program options that would potentially fit their needs. It is important to caution that what works in one city may be an absolute failure in another. The structure of a city's government, the makeup of the community, and a number of other factors can influence results. This is why once a candidate policy or program is under consideration it is important to spent some effort to contact the cities that already have implemented a similar policy and to learn as much as possible about their experience. Helpful information can include:

- The type of process used to plan and implement the program.
- The actual costs (hard and soft) of the program
- Copies of enabling legislation and ordinances
- Lessons learned
- Experiences after the program was implemented

Monitoring

Performance monitoring is an extremely important part of successful parking management. Many cities implement parking programs without setting aside the resources to monitor the outcome of the changes. This makes any evaluation of the results of the program weak in terms of value. The first mistake that is made is not to collect accurate data documenting conditions before the change was enacted. The second mistake is to make so many changes at once, that it is not clear which change is responsible for which impact. A third problem that occurs is that outside influences such as the state of the economy, other construction projects, or changes in local land use, can mask the results and make it hard to understand what is really happening. A good monitoring program involving annual collection of parking data and the maintenance of a parking data base is an excellent parking management tool. New revenue collection technologies offer the opportunity to collect much more extensive data. Besides collecting parking data it is a good idea to gather other information which measures the level of activity in an area. For example, sales tax data is an excellent measure of the economic activity in an area. Population and employment and other socio-economic data that is available from the census and from the regional planning agencies such as ABAG can also be of great value.